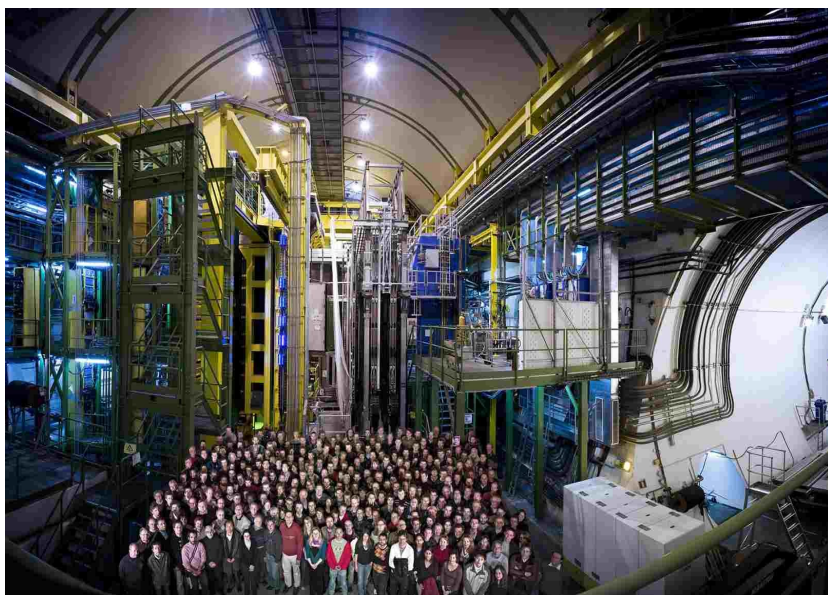


## Calorimeter Upgrade Meeting - News



F. Machefert  
LAL, Orsay

# Electronics tests

- Carlos came to LAL in November
  - A few issues solved on the digital board (→ Olivier's presentation)
  - Oscillations on the analog part (→ Carlos' presentation)
- Joined test in Barcelona (ASIC tests + digital electronics)
  - January / February ?
  - What do we need ?
    - Digital electronics setup (firmware → Olivier's presentation)
    - Software : what kind of measurement ? Linearity, noise, crosstalk, spill over, ...
- Organization of irradiation tests of a digital board with the analog mezzanine
  - 2 effects : Dose, SEE
  - Beam availability will be a problem
    - Protons (**Dose** – SEE) : PSI, CERN (?), CPO(Orsay)
    - Heavy ions (**SEE** - Dose) : GANIL (?)
  - Firmware has to be adapted :
    - USB → SPECS (maybe not necessary)
    - Mitigation of the firmware (RAM pointers, configuration registers → TVR)
  - What version of the ASIC can be used for this (mitigation) ?

- We have to prepare tests of the electronics in beam with modules/PMT/particles
  - Linearity, spill over, noise, ... in « real » conditions
  - 2 solutions to be looked at
    - Can we use the same setup as the one we had for the present electronics ?
      - Availability of the beams is an issue
      - TDC to be used and Lecroy integration availability
      - Probably some firmware adpatations required
    - Could we install an acquisition setup in the cavern and use real events
      - Can we send the signal of a few modules to both electronics
        - Choose corners and need a shutdown to prepare this
        - Factor 5 in the upgrade electronics → ok
        - Need to tune the reconstruction/trigger to compensate (present data)
      - Can we use the L0 from the experiment to perform our parallel acquisition
        - Can be extracted from a CROC → maybe not optimal (location)
        - Firmware has to be adapted to store a few consecutive events per L0
        - Would probably use the SPECS for data acquisition
      - Difficulty to correlate new/current electronics events
        - This would be most certainly very useful
        - Can we locally count the number of L0 ?

- Irradiation of the modules : Yuri
  - 2 modules in the tunnel have to be scanned during the shutdown → Yuri's presentation
    - How do it compare with the recent measurements ?
    - Scan done most probably in February
  - Need to evaluate the dose received
    - Tunnel passive dosimeters will be read during the shutdown
    - Asked Pascal Perret to read them with the other passive dosimeter of the Calo
      - Almost all the Calo passive dosimeters will be read out

## ● SPD/PRS

- Motivations for the SPD/PRS are weak
  - Physics gain (trigger, offline) looks small – maybe inexistant (remove lead)
  - Not negligible technical problems (conception, manpower, cost, ...)
  - There seems to be a general consensus on the removal of SPD/PRS

- Latest PID workshop conclusion :

We should make a decision by the end of the year (→ Pascal's talk)

- No one is really involved in it
- This requires MC simulations → see below

# MC productions planned

- There has been a MC production meeting
- Calorimeter short term issues
  - SPD/PRS decisions
  - Pile up effects on both ECAL and HCAL
- Calorimeter MC production proposal :
  - 3 luminosities :  $10^{33}$ ,  $2 \times 10^{33}$ ,  $3 \times 10^{33}$ 
    - No SPD/PRS type configuration → **3 samples**
  - 2 configurations
    - **1 extra sample** at  $2 \times 10^{33}$  with SPD/PRS
  - Choose physics channels with photons
    - 2 physics channels with photons of different Pt ranges (pile-up has varying effects with respect to the Pt)
      - High Pt :  $B \rightarrow K^* \gamma$  or  $B \rightarrow \phi \gamma$
      - Low Pt : sample with low Pt photon/ $\pi^0$ 
        - Only for  $2 \times 10^{33}$  and no SPD/PRS → **1 extra sample**
  - **5 samples in total**
    - Keep MC for all
    - Keep intermediate steps for 2 samples
      - $2 \times 10^{33}$  High Pt and low Pt
    - 100k per sample should be ok

# Electronics : Not covered items

- The « fast signal » (GBT) implementation on the new FEB is not clear
  - We would like to « externalize » this parts
    - Example of the present calorimeter optical mezzanine → Bologna
  - We could imagine building optical mezzanines (GBT, optical emitter) to plug on the FEB
- A new control board is needed in the crates
  - Should provide the clock, slow control, command signals to the backplane, FEB, TVB
- Slow control
  - Some parts have to be replaced and some other will be kept
    - FEB vs LED, HV, integrators, etc...
  - Keep SPECS everywhere would be easier for us... unless we are alone
  - Another solution would be to change the firmware of the SPECS FPGA to be kept
    - SPECS → I2C would become I2C(GBT) → I2C
      - A GBT mezzanine would replace the SPECS mezzanine
      - This looks feasible but no real work on this field yet
- The future TELL1 → TELL40 will have to be programmed to swallow the Calo data